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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:

Raymond A. Vincent

Serial No. 10/797,519

Filed March 10, 2004

LOW ENERGY FLUID

ACTUATOR CONTROL ELEMENT)

)
) Before the Examiner

)
) Group Art Unit 3753

)
) February 3, 2005

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail addressed to the Commissioner for Patents, P. O. Box 1450 Arlington, VA 22313-1450 on February 3, 2005

Matthew R. Schantz

Name of Registered Representative

Matthew R. Schantz

Signature

February 3, 2005

Date of Signature

REQUEST TO CORRECT INVENTORSHIP

Commissioner for Patents
P. O. Box 1450
Arlington, VA 22313-1450

Sir:

Applicant and Assignee of the present Application hereby request Correction of Inventorship of this Application to add Randall P. Schmitt as a co-inventor of the invention disclosed and claimed therein. As confirmed in the enclosed Declaration of Mr. Schmitt, this error arose without any deceptive intent on the part of Mr. Schmitt. A Consent of Assignee form signed by a representative of the Assignee provides its requisite consent. Finally, an Assignment is enclosed transferring rights from Mr. Schmitt to Masco Corporation of Indiana, the Assignee of the rights of the originally named inventor, Mr. Vincent.

If there are any questions regarding this filing, or any issues are raised that might be resolved telephonically by fax, please feel free to contact the undersigned.

Respectfully submitted,

Matthew R. Schantz

Matthew R. Schantz, Reg. 40,800

Woodard, Emhardt, Moriarty,

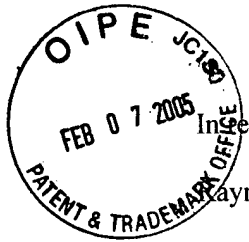
McNett & Henry LLP

111 Monument Circle, Suite 3700

Indianapolis, IN 46204

Direct Phone: (317) 713-4936

Fax: (317) 637-7561



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:

Raymond A. VINCENT

Serial No. 10/797,519

Filed March 19, 2004

LOW ENERGY FLUID ACTUATOR
CONTROL ELEMENT

)
) Before the Examiner
)
) Not Yet Assigned
)
) Group Art Unit 3753
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CONSENT OF ASSIGNEE

Commissioner for Patents
 P. O. Box 1450
 Alexandria, VA 22313-1450

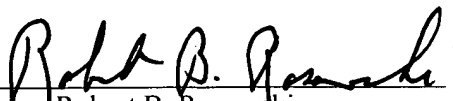
Sir:

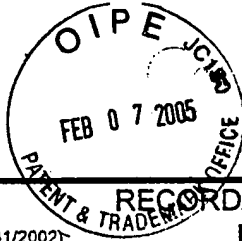
I, Robert B. Rosowski, state that I am Vice President and Treasurer of Masco Corporation of Indiana, the assignee of the subject patent application. The assignment of the invention to Masco Corporation of Indiana was executed on July 9, 2004 and mailed to the Patent and Trademark Office for recording on July 12, 2004. A copy of the Assignment and transmittal form are attached hereto. I have the authority to act on behalf of the assignee (Masco Corporation of Indiana) of the subject patent application with regard to all matters including the correction of inventorship by the addition of another inventor. I have been advised regarding the Request for Correction of Inventorship relative to the subject application and the request to add Randall P. Schmitt as one of the named inventors. The assignee hereby gives its consent to this Request for Correction of Inventorship and to the addition of Randall P. Schmitt as a named inventor on the subject patent application.

MASCO CORPORATION OF INDIANA

✓ October 27, 2004

Date

v 
 Robert B. Rosowski
 Vice President and Treasurer



WENMM-1595 (05/01)

Form PTO-1595
(Rev. 03/01)
OMB No. 0651-0027 (exp. 5/31/2002)

RECORDATION FORM COVER SHEET
PATENTS ONLY

U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office

Tab settings → → →

To the Honorable Commissioner of Patents and Trademarks: Please record the attached original documents or copy thereof.

1. Name of conveying party(ies):

VINCENT, Raymond A.

Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No

3. Nature of conveyance:

- ☒ Assignment ☐ Merger
☐ Security Agreement ☐ Change of Name
☐ Other _____

Execution Date: July 9, 2004

2. Name and address of receiving party(ies)

Name: Masco Corporation of Indiana

Internal Address: _____

Street Address: 55 East 111th StreetCity: Indianapolis State: Indiana Zip: 46280Additional name(s) & address(es) attached? ☐ Yes ☒ No

4. Application number(s) or registration number(s):

If this document is being filed together with a new application, the execution date of the application is: _____

A. Patent Application No.(s) 10/797,519

B. Patent No.(s) _____

Additional number(s) attached? ☐ Yes ☒ No

5. Name and address of party to whom correspondence concerning document should be mailed:

Name: James M. Durlacher

Internal Address: _____

Woodard, Emhardt, Moriarty, McNett & Henry LLPStreet Address: Bank One Center/Tower111 Monument Circle, Suite 3700City: Indianapolis State: Indiana Zip: 46204

6. Total number of applications and patents involved

17. Total fee (37 CFR 3.41).....\$ 40.00

- ☒ Enclosed
☐ Authorized to be charged to deposit account

8. Deposit account number:

23-3030

(Attach duplicate copy of this page if paying by deposit account)

DO NOT USE THIS SPACE

9. Statement and signature.

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

James M. Durlacher, Reg. No. 28,840
Name of Person Signing

James M. Durlacher
Signature

July 12, 2004

Date

Total number of pages including cover sheet, attachments, and document:

5

Mail documents to be recorded with required cover sheet information to:
Commissioner for Patents, Mail Stop Assignment Recordation Services
P. O. Box 1450, Alexandria, VA 22313-1450

COPY

ASSIGNMENT

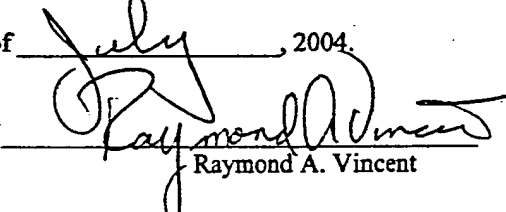
WHEREAS, Raymond A. Vincent, 8966 Colony Farm, Plymouth, Michigan 48170, hereinafter referred to as Assignor, has made a new and useful invention of **LOW ENERGY FLUID ACTUATOR CONTROL ELEMENT**, Serial No. 10/797,519, Filed March 10, 2004, for which Assignor has made application for Letters Patent of the United States; and

WHEREAS, Masco Corporation of Indiana, hereinafter referred to as Assignee, a corporation of the State of Indiana, having a principal place of business at 55 East 111th Street, Indianapolis, Indiana 46280, desires to acquire all of the entire right, title, and interest in, to and under said Invention disclosed, described and/or claimed, or intended so to be in said application, and in, to and under said application, and in, to and under any and all Letters Patent, United States and foreign, which may be obtained therefor and thereon;

NOW, THEREFORE, To All Whom It May Concern, be it known that for and in consideration of the sum of One Dollar (\$1.00) and other good, valuable and sufficient considerations to Assignor in hand paid, the receipt of which is hereby acknowledged, Assignor has sold, assigned and transferred, and by these presents does sell, assign and transfer unto Assignee, all of the entire right, title and interest in, to and under said invention disclosed, described and claimed or intended so to be in said application, and in, to and under said application for United States Letters Patent executed by Assignor this 9th day of July, 2004, and any and all other applications thereon and arising therefrom, including any and all divisions and continuations thereof, and any and all patents to be issued and obtained therefor and thereon, United States and foreign, including all reissues and extensions thereof..

Assignor agrees to sign and execute any and all other papers necessary or desirable for the procurement of Letters Patent on said Inventions in this and all foreign countries for the use of Assignee.

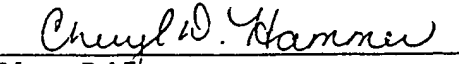
WITNESS Assignor's hand this 9 day of July, 2004.


Raymond A. Vincent

STATE OF MICHIGAN)
) : ss
COUNTY OF Wayne)

Before me, a Notary Public, in and for said County and State, personally appeared Raymond A. Vincent, who, being first duly sworn upon his oath, acknowledged the execution of the foregoing "Assignment" as his voluntary act and deed.

WITNESS my hand and Notarial Seal this 9th day of July, 2004.

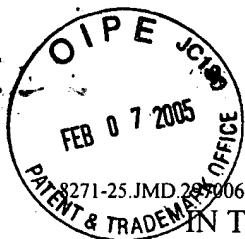

Notary Public

Printed: Cheryl D. Hammer

My Commission Expires: Oct. 28, 2006

Resident of Wayne County

CHERYL D. HAMMER
NOTARY PUBLIC WAYNE CO., MI
MY COMMISSION EXPIRES Oct 28, 2006



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:)
Raymond A. VINCENT) Before the Examiner
Serial No. 10/797,519) Not Yet Assigned
Filed March 19, 2004) Group Art Unit 3753
LOW ENERGY FLUID) August 11, 2004
ACTUATOR CONTROL)
ELEMENT)

STATEMENT BY THE INVENTOR
AFFIDAVIT OF RANDALL P. SCHMITT

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Randall P. Schmitt, being first duly sworn, do depose and state the following as my Statement for the Correction of Inventorship of the captioned patent application:


1. I have reviewed the claims of the captioned patent application, including the claims as originally filed (Exhibit A to this Affidavit).
2. I am jointly responsible for the conception of at least one of the claimed elements, believed to provide patentability, of the claims as set forth in Exhibit A.
3. I was not listed as a named inventor in the captioned patent application and this error (i.e., omission) occurred without deceptive intent.
4. During the conception of the invention disclosed and claimed in the '519 application, I collaborated with my co-inventor, Raymond A. Vincent. The invention that resulted from our joint collaborative efforts is disclosed and claimed in the '519 application.
5. Although I had co-signed an invention disclosure document with Mr. Vincent, intending to evidence our joint inventor status, that document was apparently overlooked at the time of filing the '519 application. This oversight was not corrected when the Response to the Notice of Missing Parts was filed.

6. Based upon information and belief, when the patent attorney prepared the '519 application, the co-signed invention disclosure document was not reviewed and only the first-named inventor was listed in the application papers. Since I was not provided with a copy of the application at the time of filing nor was I provided with any of the signature papers, I was unable to acknowledge that my name as a co-inventor had been omitted. It was only after my co-inventor, Raymond A. Vincent, received the Declaration for signature in response to the Notice of Missing Parts that he questioned why my name was not included. Since Mr. Vincent has retired from the employment with the Assignee, this oversight was not immediately brought to the attention of our patent attorney. As a result, the Declaration with only Mr. Vincent's name was filed with the Patent and Trademark Office.

Mr. Vincent and I have discussed this matter and we are in agreement that I should be listed as a co-inventor on the '519 application. Further, I have reviewed the application and the pending claims and can independently confirm, after considering the specific features of the claimed invention and my conception contributions, that I should be added as a joint inventor.

Upon information and belief, my omission as a named inventor for the '519 application was unintentional and occurred without deceptive intent. Nevertheless, in order to depict proper inventorship, my name should be added as one of the named inventors to the captioned patent application.

WITNESS my hand this 18 day of OCTOBER, 2004.



Randall P. Schmitt

STATE OF MICHIGAN)
) : ss
COUNTY OF Wayne)

Before me, a Notary Public, in and for said County and State, personally appeared Randall P. Schmitt, who, being first duly sworn upon his oath, acknowledged the execution of the foregoing "STATEMENT BY THE INVENTOR, AFFIDAVIT OF RANDALL P, SCHMITT" as his voluntary act and deed.

WITNESS my hand and Notarial Seal this 18 day of OCTOBER,
2004.

Cheryl D. Hammer
Notary Public

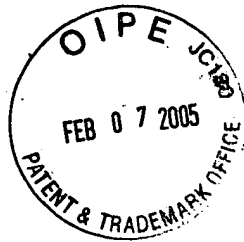
Printed: Cheryl D. Hammer

Resident of Wayne County

My Commission Expires:

10-28-2006

CHERYL D. HAMMER
NOTARY PUBLIC WAYNE CO., MI
MY COMMISSION EXPIRES Oct 28, 2006



What is Claimed is:

1. A fluid actuator for regulating fluid flow, the actuator comprising:
 - a main fluid passageway, defined at least in part by a diaphragm having an inside facing inwardly relative to the main passageway, and an outside facing outwardly relative to the main passageway;
 - a main valve disposed to inhibit fluid flow through the main fluid passageway, the main valve being connected to the diaphragm by a rigid member, and the main valve being disposed to open outwardly from the main fluid passageway, such that pressure within the main passageway tends to hold the main valve closed, and pressure on the outside of the diaphragm tends to push open the main valve;
 - a chamber defined in part by the outside of the diaphragm; and
 - a pilot valve, comprising:
 - an input passageway that diverts a portion of the fluid flow from the main fluid passageway;
 - an output passageway that directs the diverted portion of the fluid flow to the chamber;
 - a rotatable shaft disposed between the input and output passageways, the rotatable shaft having a slot therein that gives the rotatable shaft a varied cross-section as a function of its angular position, the slot being disposed to

permit fluid to flow between the input passageway and the output passageway except when the rotatable shaft is in a closed position;
a permanent magnet affixed to the rotatable shaft;
an electromagnet disposed to generate first magnetic field that, via the permanent magnet, drives the rotatable shaft away from the closed position;
a control element that places a dithered PWM current on the electromagnet, such that the length of the duty cycle controls the strength of the first magnetic field;
a second magnet disposed to generate a second magnetic field that drives the rotatable shaft away from the closed position.

2. The fluid actuator of Claim 1, wherein the second magnet is a failsafe magnet that returns the rotatable shaft to the closed position when power is lost.
3. The fluid actuator of Claim 1, wherein the second magnet is a second permanent magnet.
4. The fluid actuator of Claim 1, wherein the second magnet is a second electromagnet that receives current during the off-duty portion of the dithered PWM current.

5. The fluid actuator of Claim 1, wherein the second magnet comprises the electromagnet receiving a current with an amplitude opposite the amplitude of the PWM current during the off-duty portions of the PWM current.

6. A pilot valve for a proportional control valve mechanism, the pilot valve comprising:

an input passageway that receives a fluid;

an output passageway that outputs the fluid;

a rotatable shaft disposed between the input and output passageways, the rotatable

shaft having a slot therein that gives the rotatable shaft a varied cross-

section as a function of its angular position, the slot being disposed to

permit fluid to flow between the input passageway and the output

passageway except when the rotatable shaft is in a closed position;

a permanent magnet affixed to the rotatable shaft;

an electromagnet disposed to generate first magnetic field that, via the permanent

magnet, drives the rotatable shaft away from the closed position;

a control element that places a dithered PWM current on the electromagnet, such

that the length of the duty cycle controls the strength of the first magnetic

field;

a second magnet disposed to generate a second magnetic field that drives the

rotatable shaft away from the closed position.

7. The fluid actuator of Claim 6, wherein the second magnet is a failsafe magnet that returns the rotatable shaft to the closed position when power is lost.
8. The fluid actuator of Claim 6, wherein the second magnet is a second permanent magnet.
9. The fluid actuator of Claim 6, wherein the second magnet is a second electromagnet that receives current during the off-duty portion of the dithered PWM current.
10. The fluid actuator of Claim 6, wherein the second magnet comprises the electromagnet receiving a current with an amplitude opposite the amplitude of the PWM current during the off-duty portions of the PWM current.
11. A hands-free water faucet, comprising:
 - at least one main water passageway, defined at least in part by a diaphragm having an inside facing inwardly relative to the main passageway, and an outside facing outwardly relative to the main passageway;
 - a flap valve disposed to inhibit fluid flow through the at least one main water passageway, the flap valve being connected to the diaphragm by a rigid member, and the flap valve being disposed to open outwardly from the main fluid passageway, such that pressure within the main passageway tends to

hold the flap valve closed, and pressure on the outside of the diaphragm tends to push open the flap valve;

a chamber defined in part by the outside of the diaphragm; and

a pilot valve, comprising:

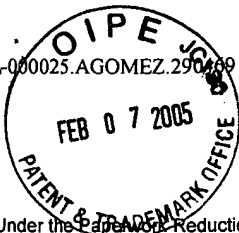
- an input passageway that diverts a portion of water flow from the at least one main water passageway;
- an output passageway that directs the diverted portion of the water flow to the chamber;
- a rotatable shaft disposed between the input and output passageways, the rotatable shaft having a slot therein that gives the rotatable shaft a varied cross-section as a function of its angular position, the slot being disposed to permit water to flow between the input passageway and the output passageway except when the rotatable shaft is in a closed position;
- a permanent magnet affixed to the rotatable shaft;
- an electromagnet disposed to generate first magnetic field that, via the permanent magnet, drives the rotatable shaft away from the closed position;
- a control element that places a current signal on the electromagnet that controls the strength of the first magnetic field;
- a second magnet disposed to generate a second magnetic field that drives the rotatable shaft away from the closed position.

12. The fluid actuator of Claim 11, wherein the second magnet is a failsafe magnet that returns the rotatable shaft to the closed position when power is lost.

13. The fluid actuator of Claim 11, wherein the second magnet is a second permanent magnet.

14. The fluid actuator of Claim 11, wherein the second magnet is a second electromagnet that receives current during the off-duty portion of the dithered PWM current.

15. The fluid actuator of Claim 11, wherein the failsafe magnet comprises the electromagnet receiving a current with an amplitude opposite the amplitude of the PWM current during the off-duty portions of the PWM current.



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WEMMH SB/01 (12-03)
Approved for use through 10/31/2002. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☐ Declaration
Submitted
With Initial
Filing

OR

☒ Declaration
Submitted after
Initial Filing
(surcharge 37 CFR
1.16 (e) required)

Attorney Docket Number	8271-25
First Named Inventor	Raymond A. Vincent
COMPLETE IF KNOWN	
Application Number	10/797,519
Filing Date	3/10/2004
Art Unit	3753
Examiner Name	UNKNOWN

I hereby declare that:

Each inventor's residence, mailing address, and citizenship are as stated below next to their name.

I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

LOW ENERGY FLUID ACTUATOR CONTROL ELEMENT

(Title of the Invention)

the specification of which

☐ is attached hereto
OR

☒ was filed on (MM/DD/YYYY) 03/10/2004 as United States Application Number or PCT International

Application Number 10/797,519 and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119 (a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Check Only If Priority Not Claimed	Certified Copy Attached?	
				YES	NO
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

I hereby claim the benefit under U35 USC 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	<input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

WEMMH SB/01 (12-03)

Approved for use through 10/31/2002. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to a collection of information unless it contains a valid OMB control number.

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below, and insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application or PCT Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (If applicable)

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:



Customer Number

30565

Place Customer Number
Bar Code Label Here

OR



Registered practitioner(s) name/registration number listed below.

Name	Registration Number	Name	Registration Number

☐ Additional registered practitioner(s) named on supplemental Registered Practitioner Information Sheet PTO/SB/02C attached hereto.

Direct all correspondence to: ☒ Customer Number Bar Code Label 30565 OR ☐ Correspondence address below

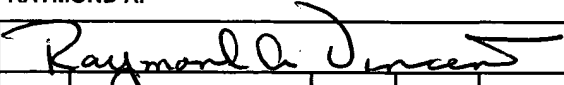
Name				
Address				
Address				
City	State	ZIP		
Country	Telephone	Fax		

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor:



A petition has been filed for this unsigned inventor.

Given Name (first and middle [if any])				Family Name or Surname			
RAYMOND A.				VINCENT			
Inventor's Signature						Date	11/8/04
Residence	City	State	MI	Country	USA	Citizenship	USA
Post Office Address	8966 COLONY FARM						
Post Office Address							
City	PLYMOUTH	State	MI	ZIP	48170	Country	USA

☒ Additional inventors are being named on the 1 supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

ADDITIONAL INVENTOR(S)
Supplemental Sheet
PTO/SB/02A

Name of Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor.									
Given Name (first and middle [if any])						Family Name or Surname					
RANDALL P.						SCHMITT					
Inventor's Signature	<i>Randall P. Schmitt</i>					Date	<i>10-18-2004</i>				
Residence	City	Clinton Township	State	MI	Country	U.S.A.	Citizenship	U.S.A.			
Post Office Address	15998 Chelmsford										
Post Office Address											
City	Clinton Township	State	MI	ZIP	48038	Country	U.S.A.				
Name of Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor.									
Given Name (first and middle [if any])						Family Name or Surname					
Inventor's Signature						Date					
Residence	City		State		Country		Citizenship				
Post Office Address											
Post Office Address											
City		State		ZIP		Country					
Name of Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor.									
Given Name (first and middle [if any])						Family Name or Surname					
Inventor's Signature						Date					
Residence	City		State		Country		Citizenship				
Post Office Address											
Post Office Address											
City		State		ZIP		Country					